REMARKS

The Examiner rejected claims 1-3, 6-10, 12-13 under 35 U.S.C. §102(e) as being unpatentable over Tews et al. (U.S. 6,599,798).

The Examiner rejected claims 1-3, 6-10, 12-13 under 35 U.S.C. §102(b) as being unpatentable over Mandelman et al. (U.S. 6,373,086).

The Examiner rejected claims 4-5, 11 and 14-20 under 35 U.S.C. 103(a) as being unpatentable over Tews et al. in view of Mandelman et al.

The amendment of claim 10 is to correct a typographical error and is not made in response to the Examiners rejection of claim 10.

Applicants respectfully traverse the §102(b), §102(e) and §103(a) rejections with the following arguments.

35 USC § 102

As to claims 1 and 7, the Examiner states that "Tews discloses a method of forming a buried dielectric collar around a trench, comprising: forming a trench in a substrate, fig. 2+, col. 3, lines 60+, forming a multilayer coating 20/21/24 on sidewalls and a bottom of the trench, removing a continuous band of multilayer coating from the sidewalls a fixed distance from a top of said trench to expose a continuous band of substrate in the sidewalls of said trench, etching, in the exposed trench extending into the trench, filling the lateral trench with a dielectric material to band of substrate, a lateral substrate in the sidewalls of form a buried dielectric collar, buried dielectric collar extends continuously around the trench (recess formed around the trench) , col. 4, lines 31+ and fig. 5, buried dielectric collar extends into said trench."

Further as to claims 1 and 7, the Examiner states that "Mandelman et al. discloses a method of forming a buried dielectric collar around a trench, comprising: forming a trench in a substrate, fig. 14C, col. 7, lines 21+, forming a multilayer coating 44/52/56 on sidewalls and a bottom of the trench, removing a continuous band of multilayer coating from the sidewalls a fixed distance from a top of said trench to expose a continuous band of substrate in the sidewalls of said trench, etching, in the exposed trench extending into the trench, fig. 14e or fig. 15d, filling the lateral trench 30 with a dielectric material to band of substrate, a lateral substrate in the sidewalls of form a buried diclectric collar, fig. 15F, buried dielectric collar extends continuously around the trench (recess formed around the trench) , buried dielectric collar extends into said trench, a multiplayer coating of oxide/nitride and polysilicon layer, filling the trench with polysilicon layer 70."

Applicants contend that claims 1 and 7, as amended, are not anticipated by Tews et al. because Tews et al. does not teach each and every feature of claims 1 and 7.

For example Tews et al. does not teach "forming a multilayer coating on sidewalls and a bottom wall of said trench." Applicants respectfully point out that in FIG. 3 of Tews et al. that layers 20/21/24 are formed on only an upper portion of the sidewalls of the trench and a top surface of polysilicon 22, only layer 20 being formed on a lower portion of sidewall of the trench and the bottom of the trench. Clearly only a single layer coating , namely layer 20, has been formed on the bottom wall of the trench.

Applicants contend that claims 1 and 7 are not anticipated by Mandelman et al. because Mandelman et al does not teach each and every feature of claim 7.

First, in a first example Mandelman et al does not teach "forming a multilayer coating on sidewalls and a bottom wall of said trench."

Applicants respectfully point out in Mandelman et al. the bottom wall of the trench is not illustrated in any of FIGs. 14a through 14g. Therefore it is not possible to determine if there is a multilayer coating on the bottom of the trench. As to FIGs 15a through 15h FIGs., though the specification states in col. 8, lines 2-3 that "a thin pad oxide 62 is grown to form only on the exposed silicon walls of the trench," FIGs. 15a through 15h clearly show oxide 62 only on sidewalls and not on a bottom wall. Further layer 66 does not even continue down to a bottom wall of the trench.

Second, in a second example, Mandelman et al. does not teach or suggest "removing a continuous band of said multilayer coating from said sidewalls a fixed distance from a top of said trench." Comparing of FIGs. 14b and 14c of Mandelman et al. it is evident that only a single layer 52 on the sidewalls of the trench is removed. In FIG. 14b there is a region of sidewalls having layers 52/56, a region having only layer 52 and a region having layers 44/56. In FIG. 14c the regions having layers 52/56 and layers 44/56 are intact and unchanged from FIG. 14b, but the in the region where only layer 52 was in FIG. 14b, only layer 52 has removed in FIG. 14c. Further, only single layer 62 is removed in FIG. 15d, not a multilayer as claims 1 and 7 require. Still further a multilayer coating 44/52/56 does not exist in Mandelman et al, as the Examiner states.

Third, the Examiner has combined the process illustrated in FIGs. 14a through 14g of Mandelman et al. with the process illustrated in FIGs. 15a through 15h of Mandelman et al. by to support the Examiners allegation that Mandelman et al. teaches of all elements of Applicants claims 1 and 15. The Examiner has taken the steps illustrated in FIGs. 14a through 14 e and combined them with the steps illustrated in FIGs. 15d through 15h by stating FIG. 14e and FIG 15d are equivalent. Any person of ordinary skill in the art would recognize that this combination

is not physically possible. For example, the structure illustrated in FIG. 15d requires the structure illustrated in FIG. 15a, but if the trench is filled with polysilicon, then the steps illustrated in FIGs. 14a through 14c cannot be performed.

Based on the preceding arguments, Applicants respectfully maintain that claims 1 and 7 are not unpatentable over Tews et al. or Mandelman et al. and are in condition for allowance. Since claims 2-6 depend from claim 1 and claims 8-14 depend from claim 7, Applicants respectfully maintain that claims 2-6 and 8-14 are likewise in condition for allowance.

35 USC § 103 Rejections

As to claims 4, 10, 15, the Examiner states that "The difference between the references applied above and the instant claim(s) is: Tews et al. teaches forming a collar in the trench with an oxide/nitride multiplayer coating but does not teaches using a resist layer and oxide/nitride and a polysilicon layer as a multiplayer coating. However, Mandelman et al. teaches at col. 7, lines 21+ and figs. 14c that using resist layer in the trench and forming a oxide/nitride/polysilicon multiplayer on the sidewall of the trench. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above references' teachings with a resist layer formed in the trench and using a multiplayer coating as taught by Mandelman et al. because resist layer and multiplayer coating is used as a mask for lateral etching the sidewall of the trench."

First Applicants maintain the arguments given *supra* in regards to the 102(b) and 102(c) rejections of claims 1 and 7 are applicable to claim 15.

Second, Applicants contend that claim 15 is not obvious in view of Tews et al. in view of Mandelman et al. because Tews et al. in view of Mandelman et al. does not teach or suggest every feature of claim 15.

In a first example, Tews et al. in view of Mandelman et al. does not teach or suggest "forming a multilayer coating on sidewalls and a bottom of said trench, said multilayer coating comprises in order from said substrate outward, a layer of silicon oxide, a first layer of silicon nitride, a layer of polysilicon and a second layer of silicon nitride."

Applicants most strongly contend that nowhere in Tews et al. or Mandelman et al. is a four layer coating taught on the sidewalls and bottom of the trench, no less a four layer coating with the exact combination and sequence of materials as claimed by Applicants.

In a second example, Tews et al. in view of Mandelman et al. does not teach or suggest "forming a second resist fill a second distance from a top of said trench, said second distance being greater than said first distance."

Applicants respectfully point out only one resist layer is mentioned in Mandelman et al. and that is in col. 7, lines 31 to 33.

Third, the rejection is improper because there is no suggestion in the prior art to combine the references as required by *Karsten Mfg. Corp. v. Cleveland Gulf Co.*, 242 F.3d 1376, 1385, 58 U.S.P.Q.2d 1286, 1293 (Fed. Cir. 2001). First, the Examiner has not given a reason to combine, but merely stated what Mandelman et al. teaches. Second the alleged motivation does originate from prior art but has been supplied by the Examiner. Therefore, the Examiner has not established his prima facie case of obviousness.

Based on the preceding arguments, Applicants respectfully maintain that claim 15 is not unpatentable over Tews et al. in view of Mandelman et al. and is in condition for allowance.

Since claims 16-20 depend from claim 15, Applicants respectfully maintain that claims 16-20 are likewise in condition for allowance.

Applicants contend that claims 4 and 10 are not obvious in view of Tews et al. in view of Mandelman et al. because Tews et al. in view of Mandelman et al. does not teach or suggest every feature of claims 4 and 10.

For example, Tews et al. in view of Mandelman et al. does not teach or suggest "defining a top edge of said band with a first recessed resist process; and defining a bottom edge of said band with a second recessed resist process."

Applicant point out that In FIGs. 14a through 14g of Mandelman et al. no resist fill is taught, in FIGs. 15a through 15h of Mandelman et al. a single polysilicon fill is taught and in Tews et al. a single resist fill is taught in describing FIG. 14 as noted *supra* and a single polysilicon fill is illustrated in FIG. 15a through 15f.

CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that claims 1-20 meet the acceptance criteria for allowance and therefore request favorable action. If Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invite the Examiner to contact the Applicants' representative at the telephone number listed below. The Director is hereby authorized to charge and/or credit Deposit Account No. 09-0458.

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